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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Hiroaki SATOH

Group Art Unit: 1762

Serial Number: 09/271,447

Examiner: Michael B. Cleveland

Filed: March 18, 1999

For: PROCESS FOR FORMING A  
PATTERN OF FLUORESCENT  
SUBSTRATE AND PLASMA  
DISPLAY PANEL

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Hiroaki Satoh residing at The Nippon Synthetic Chemical Industry Co., Ltd., Central Research Laboratory, 13-1, Muroyama 2-chome, Ibaraki-shi, Osaka-fu, Japan duly deposes and says:

1. That he graduated from Faculty of Engineering, SHIBAURA INSTITUTE OF TECHNOLOGY, Tokyo, Japan, in the year 1986, and he received the degree of Master Industrial Chemistry from GRADUATE SCHOOL OF ENGINEERING, SHIBAURA INSTITUTE OF TECHNOLOGY, Tokyo, Japan, in the year 1988;

2. That since 1988 he has been employed in the capacity of The Nippon Synthetic Chemical Industry Co., Ltd.;

3. That from 1988 he has been engaged in research and development of a photosensitive resin composition, especially of a

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dry film photoresist.;

4. That he has read and is familiar with the instant application for United States Letters Patent and Office Action thereto mailed November 12, 2003.; and

5. That he has made experiments in order to show that the resin composition layer (A) of the present invention is non-photosensitive.

### **Experiment**

A resin composition was prepared with the following composition in the following manner (dope concentration 50 % by weight).

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Component	Solid Content (Compounded Amount)
<b>Acrylic Polymer</b> Copolymer of methyl methacrylate/n-butylmethacrylate/methacrylic acid, wherein a ratio of copolymer based on weight is 49/30/21 (resin content: 40 % by weight (solvent: methyl ethyl ketone : isopropyl alcohol = 8/2 (weight ratio)), glass transition temperature: 92°C, weight average molecular weight: $6.5 \times 10^4$ , acid number: 137 mgKOH/g)	25 parts by weight (62.5 parts by weight)
<b>Fluorescent Substance</b> (Y, Gd, Eu)BO <sub>3</sub> (red) (emission wavelength: 593 nm, 610 nm, 626 nm, particle diameter: 2 to 4 μm, specific gravity: 5.1) (Zn, Mn) <sub>2</sub> SiO <sub>4</sub> (green) (emission wavelength: 529 nm, particle diameter: 2 to 6 μm, specific gravity: 4.2) (Ba, Eu)MgAl <sub>10</sub> O <sub>17</sub> (blue) (emission wavelength: 451 nm, particle diameter: 2 to 6 μm, specific gravity: 3.8)	32.5 parts by weight (32.5 parts by weight)
<b>Ethylenic Unsaturated Compound</b> Tetraethylene glycol dimethacrylate (viscosity at 20°C: 35 mPa·sec, weight average molecular weight: 330)	37.5 parts by weight (37.5 parts by weight)
<b>Polymerization inhibitor</b> 2,2'-methylenebis(4-methyl-6-tert-butylphenol)	0.025 part by weight (0.025 part by weight)
<b>Solvent</b> Methyl ethyl ketone	(57.53 parts by weight)

The above dope was applied on a polyethyleneterephthalate film so that the membrane thickness after drying becomes 25 μm and then dried. Thereafter, the coating was exposed by ultraviolet rays of 100 mj/cm<sup>2</sup>. The content of tetraethylene glycol dimethacrylate before and after exposure was measured by using an analytical curve with gas chromatography (di-n-butyl maleate was used as a standard substance)

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and whether curing had occurred or not by exposure was found by comparing the content of the compound before and after exposure.

### **Analytical Curve**

Using di-n-butyl maleate as a standard substance, the analytical curve of tetraethylene glycol dimethacrylate and di-n-butyl maleate was obtained.

### **Result and Discussion**

The weight of tetraethylene glycol dimethacrylate per 1 g of the resist before exposure was 0.38125 g (mean value of 0.3787 g (first time) and 0.3838 g (second time)). The weight of the compound per 1 g of the resist after exposure was 0.3795 g.

Therefore, the content of the compound in the resist does not change before and after exposure and the resist is not cured.

In the Experiment, 0.1 part by weight of a polymerization inhibitor is used based on 100 parts by weight of the acrylic polymer. This amount of the polymerization inhibitor is the minimum value described in the Claims and even if the amount of the polymerization inhibitor is increased, the resist obviously will not be cured. Consequently, the resin composition (A) layer of the present invention is non-photosensitive.

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The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

This 4th day of February, 2004

by Hiroaki Satoh

Hiroaki Satoh

We, the undersigned witnesses, hereby acknowledge that Hiroaki Satoh is personally known to us and did execute the foregoing Declaration in our presence on:

Date: February 4, 2004

Witness

Yoshinori Chata

Date: February 4, 2004

Witness

Shinji Wakiwagi